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10/688,588

10/18/2003

Robert Kincaid

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EXAMINER

SIMS, JASON M

ART UNIT

PAPER NUMBER

1631

NOTIFICATION DATE

DELIVERY MODE

09/24/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPOPS.LEGAL@agilent.com
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| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/688,588 | Applicant(s) KINCAID, ROBERT | |
| | Examiner JASON M. SIMS | Art Unit 1631 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15, 16, 21, 48 and 65-80 is/are pending in the application.
- 4a) Of the above claim(s) 15, 16, 21, 48 and 69 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 65-68 and 70-80 is/are rejected.
- 7) ☒ Claim(s) 65 and 67 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's election without traverse of claim 68 in the reply filed on 7/1/2010 is acknowledged.

Claim 69 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventive group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/1/2010.

Claims 15, 16, 21, and 48 have been withdrawn as being drawn to non-elected subject matter.

Applicant's arguments, filed 3/9/2010, have been fully considered. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Applicants have amended their claims, filed 7/1/2010, and therefore rejections newly made in the instant office action have been necessitated by amendment.

Claims 65-68 and 70-80 are the current claims hereby under examination.

The following objection has been newly made, which was necessitated by amendment:

Claim Objections

Claims 65 and 67 are objected to because of the following informalities: Claim 65 does not end with a period. Claim 67 ends with two periods. Appropriate correction is required.

Claim Rejections - 35 USC § 101

Response to Arguments

Applicant's arguments, filed 7/1/2010, with respect to the rejection of claims under 35 USC 101 but are moot in view of the new ground(s) of rejection.

However, applicant argues that claims 65 and dependent claims are tied to specific hardware and transform data representing real world quantities.

Applicant's arguments are not found persuasive as stating in the preamble a computer-implemented method does not necessitate a tie to a specific hardware as it is unclear as to what steps of the method are "computer-implemented." Furthermore, as the steps are drawn to an abstract process they do not necessitate any transformation of real world quantities. As such, the instant claims are drawn to non-statutory subject matter.

The following rejection is being newly added:

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 65-68 and 70-80 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 65-68 and 70-80 are drawn to a computer implemented process for displaying and manipulating data. The recited process involves the abstract and computational steps of storing and reordering data. As such, the instant claims are

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drawn only to an abstract process that only manipulates data and, therefore, are not directed to statutory subject matter.

The following rejections have been newly made, which have been necessitated by amendments:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 65-68 and 70-80 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 65 and (all claims dependent therefrom) comprises the wording “Storing an ordered data matrix comprising a plurality of measured values representing a plurality of different physical measurements performed on a plurality of samples, a plurality of sample descriptive values corresponding to each sample, and a plurality of measurement descriptive values corresponding to each physical measurement,” which has been deemed as vague and indefinite. It is unclear if the matrix comprises a plurality of measured values, which represents three different types of data, i.e. different physical measurements, sample descriptive values, and measurement descriptive values or the matrix itself comprises the three different types of data. Furthermore, it is unclear as to what each of the different types of data comprise themselves. For instance, it is unclear as to what the difference is between sample descriptive values

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and measurement descriptive values as measurement values are necessarily “descriptive” of the samples measured. Clarification via clearer claim wording is requested.

Claim 65 and (all claims dependent therefrom) comprises the step of “calculating a pseudo-data vector comprising one value for each of said samples,” which has been deemed as vague and indefinite. It is unclear as to what actually comprises the calculation aspect of said step. It appears the step is directed towards creating a “pseudo-data” vector, wherein what actually comprises a “calculation” is unclear. Clarification via clearer claim wording is requested.

Claim 66 and (all claims dependent therefrom) comprises the step of calculating the pseudo-data vector by assigning numerical data values to a selected portion of said sample descriptive values. It is unclear as to how the assignment of the numerical data results in a calculated pseudo-data vector. Clarification is requested.

Claim 70 and (all claims dependent therefrom) comprises the step of calculating the pseudo-data vector by assigning a pre-defined null value to said cell lacking a sample descriptive value. It is unclear as to how the assignment of the pre-defined null value to said cell lacking a sample descriptive value results in a calculated pseudo-data vector. Clarification via clearer claim wording is requested.

The following rejection has been modified, which was necessitated by amendment:

Claim Rejections - 35 USC § 103-Modified

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 65-67, 69, 75, and 79-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warrington et al. (P/N 6,884,578; no. 2 reference in IDS submitted 11/6/2008) in view of Rusterholz (US P/N 5,864,838) and further in view of Balaban et al. (6,185,561; no. 3 reference submitted in IDS 11/6/2008).

The claims are directed to a computer-implemented method for displaying and manipulating data, the method comprising:

Storing an ordered data matrix comprising a plurality of measured values representing a plurality of different physical measurements performed on a plurality of samples, a plurality of sample descriptive values corresponding to each sample, and a plurality of measurement descriptive values corresponding to each physical measurement;

Providing a two dimensional detail display having a plurality of cells, each cell corresponding to one of said values in said data matrix, said display providing a view of a portion of said data matrix that is defined by a base location in said matrix;

Calculating a pseudo-data vector comprising one value for each of said samples;

Re-ordering said data matrix based on a measure of similarity between said pseudo-data vector and measured values of said data matrix; and

Displaying on said display a new portion of said data matrix based on said re-ordering.

With regards to claims 65 and 75: Warrington et al. teach limitations of claim 1 at col. 12, lines 41-67, col. 13, lines 1-38 and col. 25, lines 25-44. Warrington et al. discusses at col. 12 and 13, inputting data items associated with entities to be observed, where the data is arranged in an $n \times m$ matrix, as it is stored in tables forming a database or comprising a relational database, which reads on an ordered data matrix. Warrington et al. further teach at cols. 12 - 13 and at col. 14, lines 32-48 different types of data items being stored, such as expression values, which reads on a plurality of measured values representing a plurality of different data being stored. Warrington et al. further describe at col. 14, lines 32-48, lines 61-67, and col. 15, lines 30-47 that this data can be analyzed by software and interacted with using a graphical user interface to identify patterns and variation. Warrington et al. at col. 13, lines 54-58 describe an illustrated example of a computer system that may be used to execute the software of an embodiment of the invention, wherein the system comprises a display. Therefore, it

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is inherent that Warrington et al. teach a display used for displaying the tables of data and results of the analysis and data manipulation steps, etc.

Warrington et al. do not explicitly teach calculating a pseudo-data vector, i.e. selecting a row or column, and reordering the data in the matrix based on a measure of similarity between said pseudo-data vector and measured values of said data matrix.

Warrington et al. teach and describe a relational database, wherein it is a recognized property of relational database design that rows or columns can be sorted and reordered based on varying criteria or rules created by the designer.

Rusterholz teaches at the abstract, col. 4, lines 55-67 through col. 8 a method for rearranging tables of data and a reordering module designed to reorder the data in different ways, such as by user input and using "pseudo-data vectors," i.e. arrays wherein the vector data is used for reordering.

Balaban et al. at col. 3, lines 5-11 teach a query that can be submitted to the relational database tables wherein it extracts information from a matrix of data and can display or sort and thus reorder the data, such as those genes where the gene expression value is greater than or equal to 100. The query, in a sense, selects a set of data, wherein the selected matched data is equated with having a preset positive value, i.e. selected and the non-matched/selected data will have a null or negative value, thus calculating a pseudo-vector. The stored data is not necessarily in an order from least expression value for a gene to greatest expression value for a gene. Thus the query itself mines the data of those genes whose expression value is greater than 100 and thus reorders the data to be better visualized by a user. Furthermore, Balaban et al. at

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col. 5, lines 54-56 describes an expression mining database where the user can query and mine the data, wherein the type of querying can vary depending on the user and questions that the user wants to be answered. It is therefore implied that the mining of data as taught by Balaban et al. incorporates the capability of sorting and reordering the expression data as it is a common goal of any data mining to be able to sort and reorder data.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to mine data by sorting and reordering the data and have different visualization techniques as taught by Rusterholz and Balaban et al. in the method of Warrington et al. because it can be more effective and is a goal of the researcher to be able to visualize and manipulate data in customizable ways in order to be able to more effectively interpret experimental data. Furthermore, the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art.

Balaban et al. at col. 3 and 5 using queries, i.e. pseudo-data vectors comprising numerical data values as in claim 66.

Rusterholz further teaches at col. 5 using binary data values as in claim 67.

With regards to the limitations of claims 79-80 of transmitting and receiving the resulting data obtained by the method of claim 1: Balaban et al. describe at Fig. 2B a computer network suitable for use in conjunction with the taught invention, which comprises a LAN and computer networks, which inherently have the capabilities of forwarding, transmitting, and receiving data. Balaban et al. further teach that the taught

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invention formats resulting data for viewing by a user, see claim 1. Thus Balaban et al. teach the method steps of forwarding, transmitting, and receiving resulting data as in claims 79-80.

Response to Arguments

Applicant's arguments filed 3/9/2010 have been fully considered but they are not persuasive.

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

For instance applicant argues that in the Warrington et al. reference there was no motivation for making a choice of criteria required by the current invention for reordering a matrix.

Applicant's argument is not found persuasive because it is the combination of Warrington et al., Rusterholz, and Balaban that teach the claimed invention. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant further argues that Balaban '561 method of extracting data and re-ordering, occurs on a new table and not the re-ordering of the original database.

Applicant's arguments are not found persuasive as Rusterholz teaches re-ordering the original database table.

Applicant further argues that the previous references do not teach a query based on a similarity measure.

Applicant's arguments are not found persuasive as Rusterholz teaches said limitation as described above.

Applicant further argues at page 7 that the references do not teach the calculation of a pseudo-data vector.

Applicant's arguments are not found persuasive because Rusterholz as described above teaches said step.

Applicant further argues that the fact that certain measures of distance are known in clustering theory, such as calculating Euclidean distance, does not make those measures obvious as criteria for ordering records.

Applicant's arguments are not found persuasive as Balaban and the combination of references provides motivation for manipulating data in different ways, such as by the use of known methods as calculating distances as described below in the instant Office Action.

Claims 68, 70-72, and 76-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warrington et al. (P/N 6,884,578; no. 2 reference in IDS submitted 11/6/2008) in view of Rusterholz (US P/N 5,864,838) and further in view of Balaban et al. (6,185,561; no. 3 reference submitted in IDS 11/6/2008) as applied to claims 65-67, 69, 75, and 79-80 above and further in view of Balaban et al. (US A/N 2003/0028501).

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Warrington et al., Rusterholz and Balaban ('561) teach claims 65-67, 69, 75, and 79-80 as described above.

The combination of references suggest, but do not explicitly teach the limitations of claims 68 wherein color-coding particular cells is taught.

The references suggest this because they teach various forms of manipulating and displaying data. For instance, Balaban et al. ('501) teach at paragraphs [0066]-[0069] displays may be in various forms, such as bar graphs, histogram graphs wherein a user can specify options such as range and color, etc. Therefore, using color as a way of displaying and manipulating data is recognized by Balaban et al. ('501).

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have used color for displaying as taught by Balaban et al. ('501) for color-coded cells of at least one row of data in the method taught by Warrington et al, Rusterholz, and Balaban ('561). This is because using color as a way of displaying and manipulating data is recognized by Balaban et al. ('501) as a functionality used in data manipulation and displays by those of ordinary skill in the art. Therefore, the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art. Furthermore, one of ordinary skill in the art would have recognized that the results of the combination were predictable.

With regards to limitations of claims 70-72 and 76-78: Balaban et al. ('501) teach at Figs. 4A and 9A-9F and paragraph [0045] an LIMS system comprising a database of annotative data. Balaban et al. ('501) further teach at paragraph [0071] that the

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annotations can be user defined, which further reads on applicant's definition of a pseudo-vector at paragraphs [0012]-[0013] wherein a user input may be provided for, wherein a user or the system may input predetermined values to be substituted for the descriptive data values and a pseudo-vector may be calculated from arbitrary data input from a user. The annotation query, in a sense, selects a set of data, wherein the selected matched data is equated with having a preset positive value, i.e. selected and the non-matched/selected data will have a null or negative value, thus this step assigns data values to the annotative data items.

Claims 73-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warrington et al. (P/N 6,884,578; no. 2 reference in IDS submitted 11/6/2008) in view of Rusterholz (US P/N 5,864,838) and further in view of Balaban et al. (6,185,561; no. 3 reference submitted in IDS 11/6/2008) as applied to 65-67, 69, 75, and 79-80 above and further in view of Schadt et al. (US P/N 7,035,739).

Warrington et al., Rusterholz and Balaban ('561) teach claims 65-67, 69, 75, and 79-80 as described above.

The combination of references set forth above suggest, but do not explicitly teach calculating a distance value between rows assigned a similarity value wherein the calculation is a Euclidean distance as in claims 73-74.

The references suggest this because Warrington et al. at col. 27, lines 25-44 discuss data items based on gene expression data, but derived from GeneCluster

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software analysis. For example, GENECLUSTER performs a data analysis that involves clustering data such as hierarchical clustering, Bayesian, and k-means clustering wherein these types of clustering methods calculating a distance based on a Euclidean distance is commonly used and well known methods.

Schadt et al. teach starting at col. 8, lines 21-47 using a Euclidean distance is a well known statistical method in the art. Furthermore, Schadt et al. teach at col. 11, lines 3-27 using data stored in a database to perform the data manipulation step.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to have calculated a distance using an Euclidean distance, or a squared Euclidean distance as taught by Schadt et al., in the method made obvious by Warrington, Rusterholz, and Balaban for manipulating data. This is because one of ordinary skill in the art would find the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art. Furthermore, one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Conclusion

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Sims, whose telephone number is (571)-272-7540.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marjorie Moran can be reached via telephone (571)-272-0720.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571)-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/ Jason Sims /

/Marjorie Moran/
Supervisory Patent Examiner, Art Unit 1631